



Gaiareport 2001

HORIBA / Environmental Report

HORIBA

Explore the future

Corporate Data

Company Profile (As of March 31, 2001)

Corporate Name:

HORIBA, Ltd.

Founded:

October 17 1945

Incorporated:

January 26 1953

Head Office:

2, Miyanohigashi-cho, Minami-ku, kyoto,
601-8510, Japan

Paid-in-capital:

¥6,578 million

Fiscal Closing Date:

March 20, annually

Stock Listings:

Tokyo stock Exchange (1st Sector)
Osaka Securities Exchange (1st Sector)

Business:

Analyzer, Environmental measurement system

Net Sales:

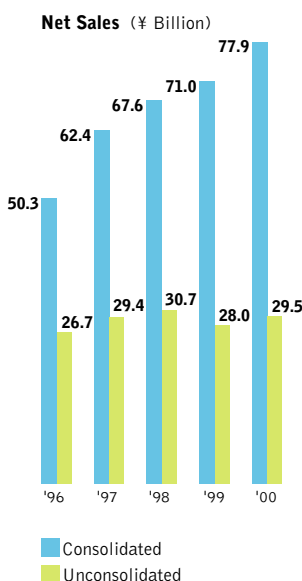
Consolidated ¥77,873 million
Unconsolidated ¥29,481 million

Operating Income:

Consolidated ¥4,750 million
Unconsolidated ¥1,348 million

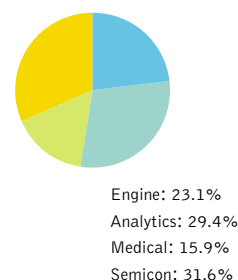
Employees:

Consolidated 3,540
Unconsolidated 1,087



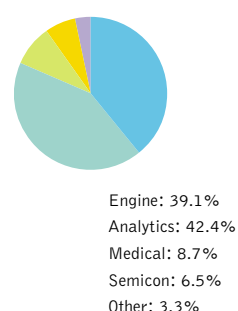
Percentage of Net Sales in Fiscal 2000

Consolidated net sales: ¥77.9 billion



Percentage of Net Sales in Fiscal 2000

Non consolidated net sales: ¥29.5 billion



Environmental Load Produced at HORIBA

Items	Unit	1999	2000
Total environmental load ¹⁾	ton-C ¹⁾	1,283	1,270
Consumption of electricity	m-kWh	9.88	9.59
Consumption of city gas	km ³	225	449
Consumption of water ²⁾	km ³	51	46
Waste produced	ton	328	338
Exhaust of final waste	ton	180	187

1) Calculated from CO₂-converted value

2) Including city water and underground water

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To the Reader

This report, "Gaiareport 2001", was compiled with the aim of describing the environmental preservation activities conducted by HORIBA, Ltd. in fiscal year 2000 (March 21, 2000, to March 20, 2001).



President's Message



HORIBA, Ltd. is engaged in the business of manufacturing instruments for monitoring and measuring substances that affect the environment, and the very nature of our business expresses our company's attitude and the role it plays regarding environmental issues.

In addition to implementing an in-company environmental control system, we must strengthen our efforts to develop and supply effective instrumentation systems for environmental programs. This is the foundation of our environmental policy.

Our products are used for a broad range of purposes, including monitoring air and water quality, medical analysis, measuring automotive engine performance and emissions, semiconductor production, and the development of fuel cells and micro-machining systems.

We believe that by responding to user needs while minimizing the load on the environment imposed by our products, we can make a significant contribution to global environmental preservation efforts.

"Contribute to global environment preservation and seek harmony between Man and Mother Earth." This is declared in HORIBA's corporate philosophy adopted in 1994. Our Horiba environment management system was granted ISO-14001 certification in 1997. We were among the first to stop using materials that deplete the ozone layer and chlorine-based organic solvents, and our efforts to improve the waste recycling rate produced positive results in the form of significantly reduced consumption of electricity, water, and paper.

For the second stage of our environmental project that started this year, we have set our sights even higher so as to create a corporate system befitting a recycling society.

We also intend to make a greater contribution to global environmental preservation by the HORIBA Group as a whole by sharing environmental information among all our group firms and affiliates in Japan and abroad.

I sincerely hope that this Gaiareport 2001 will help our readers better understand HORIBA's environmental activities, and I look forward to receiving many useful suggestions from its readers.

Atsushi Horiba
President

Environmental Management System

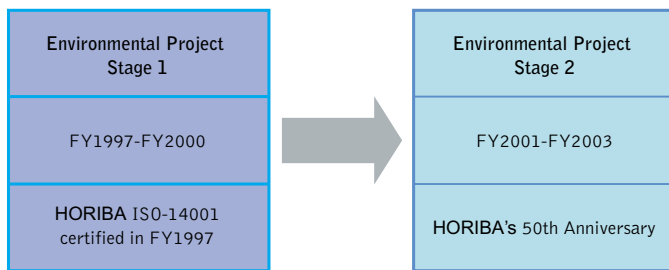


Fundamental Attitude Towards Environmental Activities

HORIBA, while developing and supplying analyzers for use in various environmental programs, has also been striving to promote environment-oriented behavior throughout our company. The main objective is to achieve highly efficient productivity by eliminating waste and repetition in all of our business activities, thereby reducing the load imposed on the environment when our products are being produced and when our products are being used.

In the second stage of our environmental project that started this year, our goal is to reduce the load imposed on the environment by our products from a broader viewpoint, thereby helping to promote the creation of a sustainable recycling society.

Environmental Project Stage 2



Environmental Philosophy and Environmental Policy

Environmental Philosophy

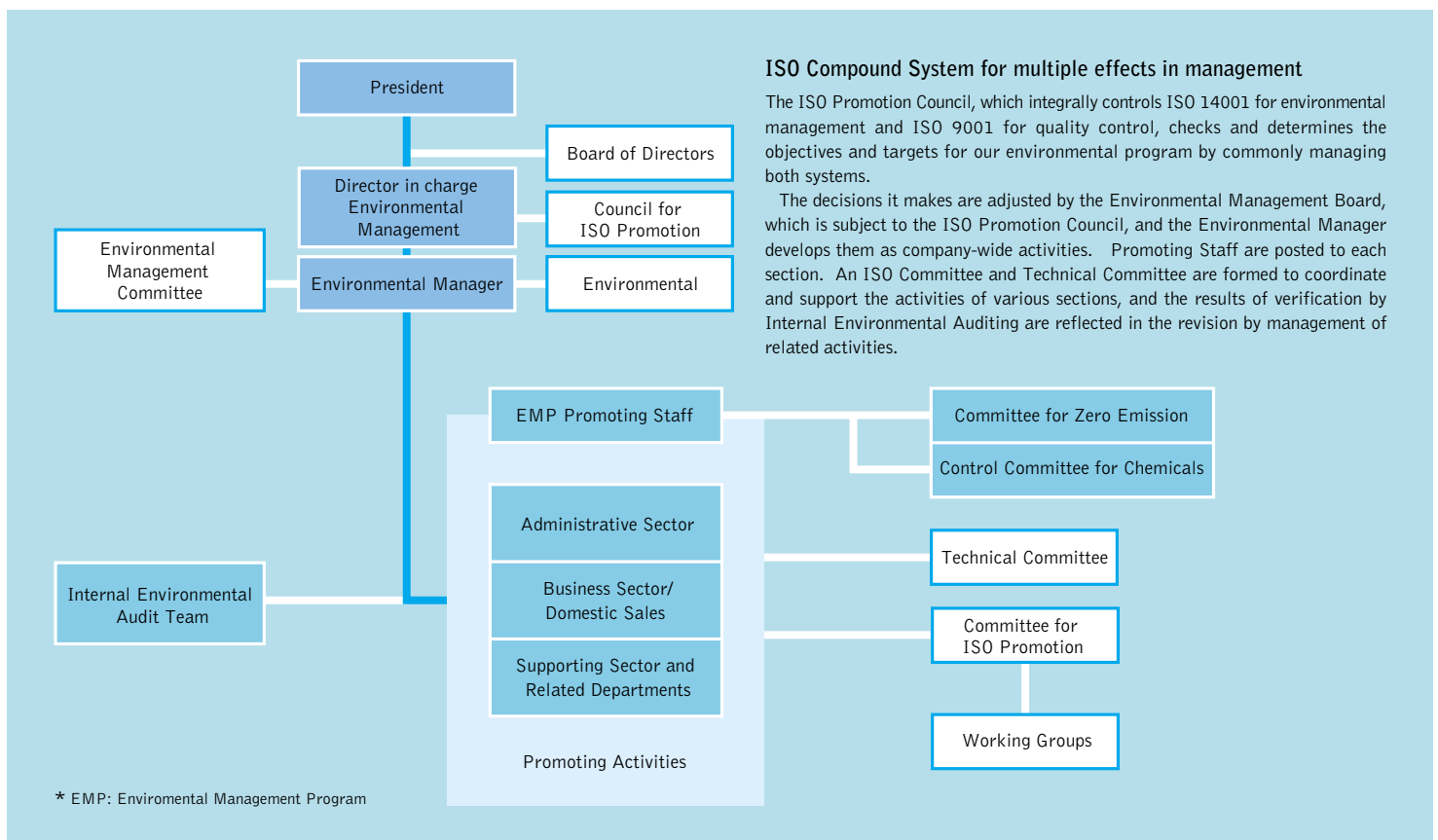
We are committed to the preservation of the global environment as we work to challenge the limits of technology to ensure the harmonious coexistence of humans and nature.

Environmental Policy

The following environmental policy was adopted with the aim of fulfilling our responsibilities to society through the development and diffusion of analyzers, measuring systems, and peripheral devices that contribute to protecting or improving the global environment.

1. Endeavor to develop products that pay consideration to the environment by placing primary emphasis on reducing the load on the environment.
2. Prevent environmental pollution and promote the saving of resources and energy through sustainable environment improvement activities.
3. Protect and improve the environment by setting voluntary control standards in addition to observing all environment-related laws and regulations.

Management Structure



Environmental Project Stage 2

Broadening the scope and narrowing the focus of our activities to help create a recycling society.

In order to contribute to the creation of a recycling society befitting the 21st century, we must promote re-use and recycling, reduce waste, and pay closer attention to human health.

After successfully implementing the far-reaching environmental measures planned in response to our being awarded ISO-14001 certification in 1997, HORIBA has launched the second stage of its environmental project in fiscal 2001. With an eye to the year 2003, when our company will celebrate the 50th anniversary of its founding, we have set the following targets: developing environmentally friendly products, minimizing waste, implementing strict control over chemical materials, and developing environmental activities on a global scale. In addition, we will expand the scope of our activities from the head office/factory to all our sales offices throughout the country. As our contribution to the creation of a better society, we intend to take the following concrete measures.

- * Set design standards for environmentally friendly products and label those products which satisfy those standards.
- * Reduce the total volume of waste generated by our business activities, and thoroughly pursue the sorted collection of waste and recycling.
- * Promote the development of substitutes for chemical materials that must eventually be banned, and reduce the use of chemical materials that must be controlled.
- * Tackle the themes of saving energy and promoting respect for the environment as a company-wide activity.
- * Distribute information on environmental activities to group companies and develop environmental activities on a global scale.

HORIBA Environmental Action Plan for 2001

1. Expand environmental preservation activities from the head office to all related workplaces.
 - * Expand environment inspections to local sales offices.
 - * Begin distributing environmental information to subsidiaries and affiliates.
2. Develop environmentally friendly products and expand the reuse and recycling of products.
 - * Begin designing environmentally friendly products and implement "green" procurement and lead-free production.
 - * Build up a system for collecting reusable products/parts from customers.
3. Establish a "zero-emissions" production system.
 - * Implement the sorted collection and recycling of waste, and thoroughly control and reduce the use of chemical materials.
 - * Reduce the load imposed on the environment by our production activities by 1% (CO₂ conversion basis) per year.
4. Energize communication.
 - * Promote the sharing of environmental information with subsidiaries and affiliates.

Environmental Achievements and Targets

Object	Achievements in 1997 to 2000	Targets for 2001 to 2003
(1) Establishment of the Environmental Management System (EMS)	a. HORIBA's environmental management system was granted ISO-14001 Certification in June 1999. b. HORIBA installed a 46-channel automatic monitoring system for environmental parameters to ensure its voluntary control standards would be maintained. c. HORIBA started the environmental account in 1999. d. A positive attitude toward tackling environmental management was created among the employees.	Improvement of EMS of all HORIBA Group companies Reinforcement of the monitoring system Theoretical Development of the environmental management Maintaining the positive attitude toward environmental preservation
(2) Production System that Reduces the Load on the Environment	a. Use of fluoride compounds and chlorine-based solvents was discontinued by 1999. b. Total electricity consumption was reduced by 8.6% from 1998 to 2000. c. The recycling rate of waste was improved from 26% to 45%.	Stricter control of chemicals covered by the PRTR Reduction of total load on the environment imposed by business operations Zero emissions
(3) Development of Environment-Friendly Products	a. The power requirements of major products were reduced by 10%. b. The carbon tetrachloride for sulfur-in-oil analyzers was entirely replaced by substitutes. c. The re-use/recycle rate of packing materials reached 12% in 2000.	Development of the environment-friendly products Improvement of the reuse/recycling rate of used products
(4) Social Activities	a. HORIBA donated a number of acid rain measuring kits as teaching materials to elementary schools in the city of Kyoto. b. HORIBA dispatched the personnel to acid rain study centers to lend them technical support, and also sent an engineer to Paraguay as a JICA expert to help the water quality management project. c. HORIBA actively participated in exhibitions and meetings held to educate the public about environmental issues. d. A series of talks with scientists about the environment were presented on the web site.	Continuation of social activities
(5) Publication of Environmental Information	a. Since 1998, a report of HORIBA's environmental activities has been publicized annually with the environmental account.	Planning an advertising campaign about environmental issues

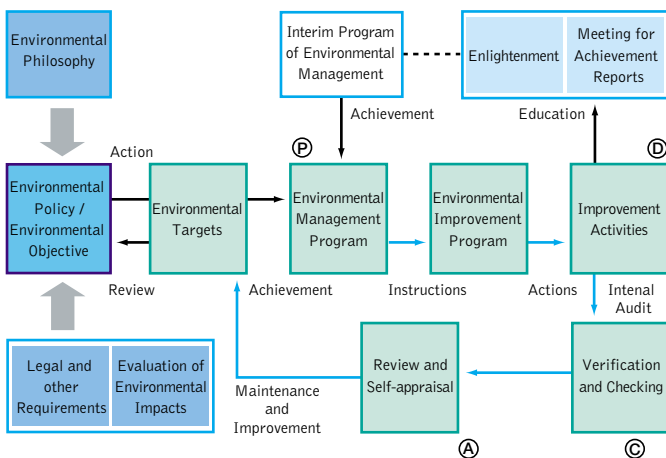
Environmental Management Program



Environmental Management Program

HORIBA will establish environment objectives and environment targets in relation to legal requirements and significant environmental aspects in line with the requirements of ISO-14001, based on which each section will carry out environment programs. Verification by an internal environment audit and an evaluation of the degree of achievement by self-appraisal constitute a key part of the management cycle to review environmental policies and environmental plans.

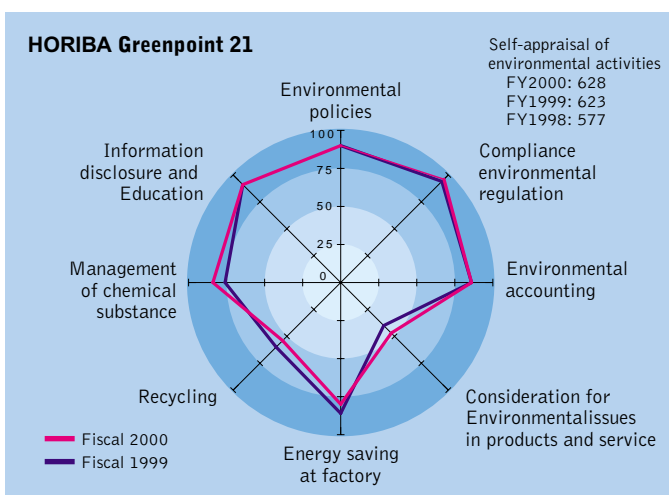
Management Program Flow Sheet



Self-appraisal of Environmental Activities

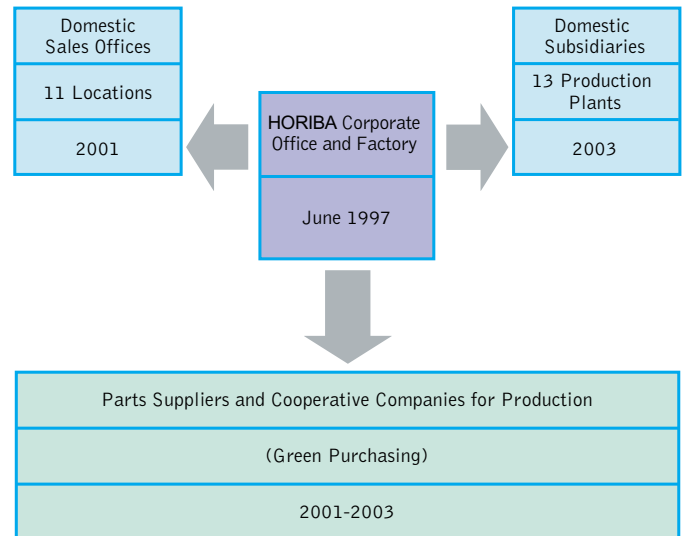
The results of self-appraisal of environmental activities covering eight items are shown in the radar chart. Using 1998 as the base, the Green Point 21 growth rate of improvement was 21% in 1999 and 26% in 2000. For 2003, we will aim at 90-point or higher achievement for every item.

(Green Point 21: Environmental management degree evaluation system proposed by Hitachi, Ltd.)



Expanding and Developing the ISO System

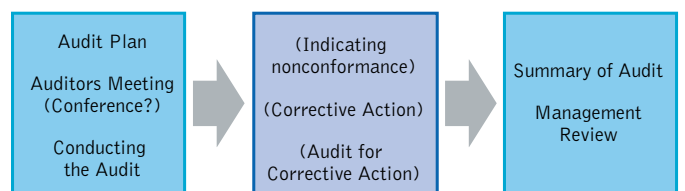
The HORIBA Group includes eight subsidiary companies in Japan and 30 overseas. Stage two of the environmental project calls for expanding the environment site to include 11 domestic sales bases in 2001, and establishing an environmental management system for 13 subsidiaries in Japan and overseas with production functions by 2003.



Internal Environmental Audit

An internal environmental audit of each section will be conducted one or more times every year for each section. The 40 internal environment auditors will form independent teams and will verify the environmental activities of each section. The environment auditors will maintain and improve the necessary standards by studying auditing techniques and legal trends.

Internal Audit Scheme



Observation of Laws and Preventive Maintenance

HORIBA pursues preventive maintenance by voluntarily conducting the periodic measurement of the site environment by the "environment analysis system" even though HORIBA is not categorized as a specified factory. We also carry out drills for such emergencies as earthquakes and fires. HORIBA has an ample number of employees duly qualified for the legal management of environment-related matters.

Legal Qualification Personnel List

Regally qualification	(Holding)
Environmental analyzing and measuring managers	6
Pollution prevention managers (General)	2
Pollution prevention managers (Air)	28
Pollution prevention managers (Water)	24
Pollution prevention managers (Others)	9
Energy managers	2
Hygienic managers	18
Work environmental Measurement engineer	4
Boiler engineer	11

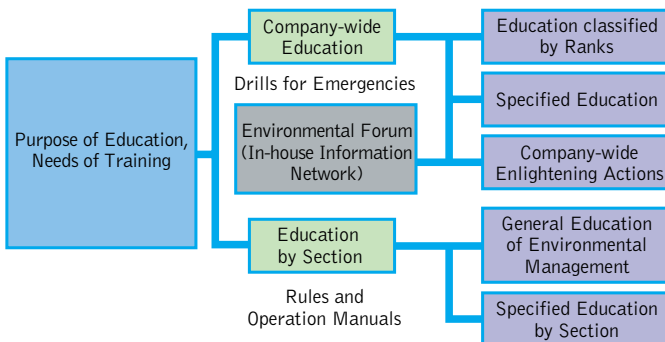
Education and Enlightenment Activities

HORIBA's well-planned environmental education includes enlightenment activities that include lectures, an in-house information network, and in-house journal, as well as specialized education to match the situation of each section.



Training for emergency

Education System



General Meeting of EMP*

A general meeting of the environmental management program is held annually. At that meeting projects to improve the environmental aspects are discussed based on the proposals and the achievement reports presented by staff members.

*Environmental Management Program

Achievement exposition



EMP Meeting



Environmental Management Seminar

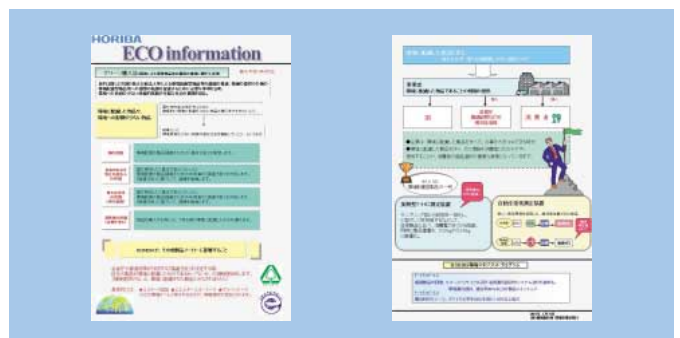
In 2000 the company invited a specialist to arrange a seminar for studying "How to Design Environmentally Friendly Products". About 70 engineering staff members from various sections attended.

Environmental Design Seminar

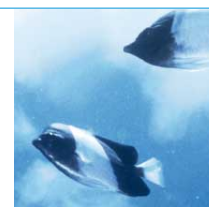


HORIBA Information Network "HORNET"

The news and the enlightening information for environmental management programs are distributed to all the HORIBA personnel via the HORNET, an in-house information network.



Environmental Account



A financial review of the environmental activities at HORIBA in its fiscal year of 2000 is shown in the table below. The accounting system is based on the guidelines of the Ministry of the Environment of Japan.

The amount of 179 million yen, a 30% increase over the previous year, was spent mainly to improve and maintain the environmental management systems and to convert existing equipment to the energy saving type.

In the next step, more investment will be made in the area of R&D, green procurement, and the efficient transportation of products, etc. to increase the economical effects.

Costs for Environmental Preservation

(Millions of Yen)

Item	Investment	Expenditure	Remarks
1 Maintenance of equipment, energy saving, etc.	13.3	27.2	Install additional inverters. Pretreatment of Waste.
2 Reuse, recycling of fringe materials, etc.	0.2	9.8	Green Procurement Selected transportation of products.
3 Maintenance of environmental management	5.4	131.8	Appoint four(4) environmental staff. Internal audit and seminar.
4 Social activities	13.4	10.3	Maintenance of the homepage HONEST.
5 Damage to the environment	0.0	0.0	(No environmental damage.)
Sub-total	32.3	179.1	Increased 40 million yen from the previous year at Expenditure.
6 R&D for environment-related products	52.6	462.8	Sharing 21.3% of total R/D expenses.
Grand total	84.6	641.9	Increased 188 million yen from the previous year at Expenditure.

Economical Effects

(Millions of Yen)

Item	Economic effect	Remarks
1 Saving of electricity, gases and water	38.2	Saved water consumption by 5000m ³ .
2 Curtailment of chemicals in production lines	0.1	Improved yield rate saved detergent.
3 Return from the type-collection of refuses	8.4	Income from sales of wastes of metals, solders, used harnesses, etc.
4 Reuse/recycling of paper, packing materials, etc.	2.1	Reuse of corrugated paperboards. Recycle of OA papers.
5 Return from energy-saving design of products	0.0	Simplify the packages of products.
Sub-total	48.8	Reduced 2 million yen from the previous year.
6 Energy saved by the products of energy-saving design	6.1	Saved 410,000 kWh for the power requirements of products.
Grand total	54.9	Increased 4 million yen from the previous year.

Effects on Materials

Item	Materials Effects	Remarks
1 PRTR related chemicals reduced	227 kg	Discontinuance of fluoride compounds and chlorine-based solvents.
2 Recycling waste	151 Ton	Wastes of plastics, metals, office paper, etc.
3 Green Purchase	6 Items	Office machines, OA papers, work uniforms, etc.

Remarks

- The cost of R&D is listed as the sales of environment-related products takes a large portion in the total income.
- The depreciation of equipment is not included in the above expenditures.
- The amounts in the column of economical effects are calculated from the mass of materials saved in the year of 2000 compared with the former year.
- In the fiscal year of 2000, the company's investment in total was ¥398 million, and its total amount of R&D expenses was ¥2,025 million.

Environmental Improvement Activities



The achievements of environmental activities at HORIBA in the business year of 2000 are described. The financial effects are shown in the Environmental Account.

Objective 1 Development of Environment-Friendly Products

(1) Reduce the Power Requirements of Products

Target: Reduce the power requirements of existing models by 10%

Result: Target met for all the newly designed models listed

Power Requirements (electricity)

Models	MEXA-324L	VIA-100	LT-120	CS-1XX
The former model	60VA	300VA	62VA	200VA
Targets of reduction	6VA	30VA	7VA	20VA
Results of reduction	10VA	135VA	19VA	120VA
The new model	50VA	165VA	43VA	80VA
Ratio of Reduction	16%	45%	31%	60%

(2) Reuse and Recycle Packing Materials

Target: Reuse or recycle 10% of packing materials

Results: Up to 11.8% of the packaging materials for 12 items of products are now reused or recycled.

Product	Product A	Product B	Product C	Product D
Original	Urethane	Plastics	Wooden frame disposed	Cardboard box
Changed to	Corrugated paper	Corrugated paper	Wooden frame reusable	Delivery box
Effects	Recycling	Recycling	Reuse	Reuse
Reduction of materials	256kgs	215kgs	672kgs	2,772kgs

The MEXA-324L is an automotive emission analyzer for use at service stations and motor vehicle periodic inspection centers. HORIBA has sold over 100,000 sets sharing a half of Japan's market.

The VIA-100 is an infrared gas analyzer widely used in various industries for process control and the environmental

monitoring stations. By employing a new temperature compensation system, HORIBA eliminated the need for a heating device and significantly reduced power requirements. The LT-120 is a CRP (C-reactive protein) measuring instrument for clinical tests. The CS-1XX is a series of liquid concentration monitors to be used in the semiconductor production processes.

A: pH Electrodes
Glass-made pH electrodes need cushioning in the box to be transported safely. A newly designed box allows the use of corrugated paper for recycling instead of disposable urethane foam. Thousands of pH electrodes are delivered annually by HORIBA.

B: Portable Auto Emission Analyzers
The plastic cushions formerly used in the box were replaced by corrugated paper that can be recycled.

C: Metal Analyzers
The instruments are heavy and bulky, and need to be packed in wooden frames for shipping. The new box that uses bolts to fasten the frames is reusable after delivery, saving lumber and labor.

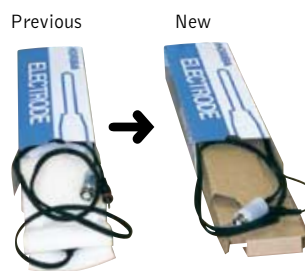
D: Accessories for Auto Emission Analyzer Systems
The cardboard shipping boxes used by the customer were replaced by reusable containers.



MEXA-324L Automotive Emission Analyzer



VIA-510 Infrared Gas Analyzer



Boxes for pH electrode



Reusable wooden frames

Objective 2 Environment-friendly Operations

(1) Saving Electric Energy

Target: By 2001, reduce power consumption factor down to 97% of that for 1998.

Results: Consumption factor in 2000 was 98.6% of 1998.

Remark:

Power consumption factor = total electric power used in the year (megawatt-hours) divided by annual sales amount (¥ billion)

Examples of actions:

- Turn off power to machines and equipment during weekends and holidays.
- Readjust all the machines to their optimum operating condition whenever they are restarted.
- Set air-conditioner control temperature to 29 degrees C in summer and 18 degrees C in winter.
- Install inverters in the loads of motors operated continuously.
- Convert the energy source of air-conditioners from electricity to gas.

Gas and Water Consumption:

Remarks:

- The increase in gas consumption is due to converting the energy source of air-conditioners from electricity to gas.
- Water-saving fixtures are installed at outlets and water flows are watched continuously for control of total water consumption.

Productivity Plans Incorporate Environmental Action:

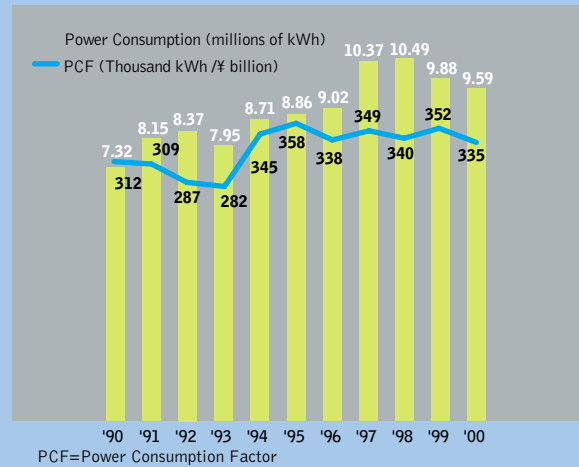
In the newly introduced BJ Project, each production department must promote its own productivity, and the productivity plan must incorporate environmental improvement measures. The following are a few examples of the voluntary measures which the production departments are taking in addition to the company's environmental management program.

- Replace the cartons used by suppliers of parts and components with reusable containers to reduce the amount of solid waste.
- Use manifolds to distribute gases to the analyzers on the production lines to reduce the number of gas cylinders.

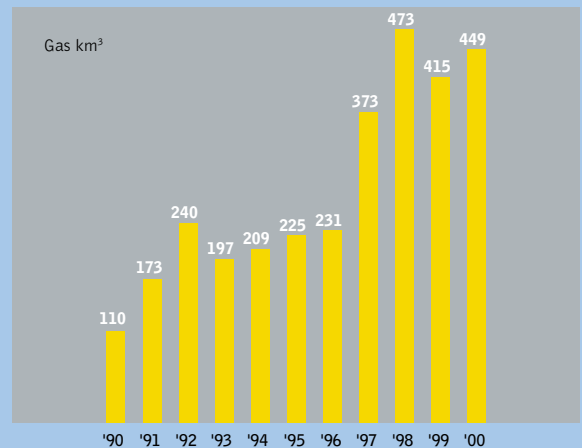


Production Line of Ambient Air Monitoring System

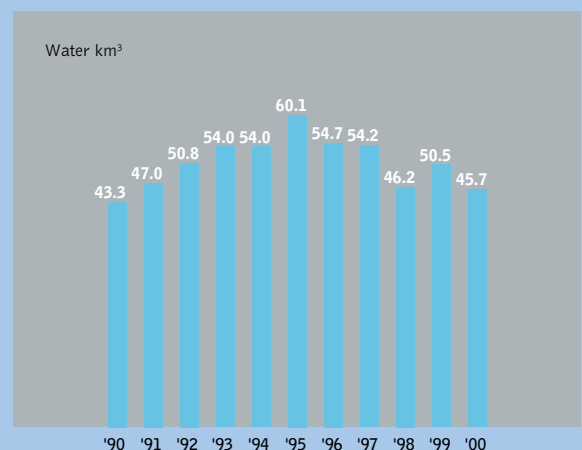
Power Consumption and PCF



Town Gas Consumption



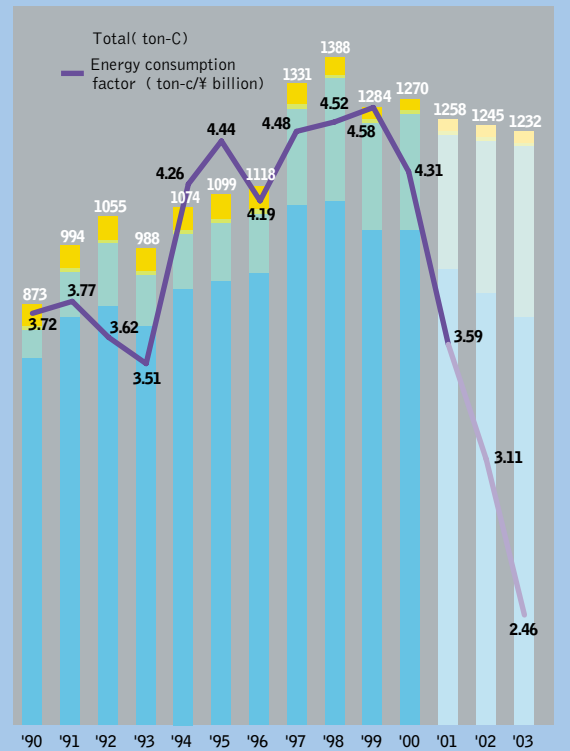
City Water Consumption



Total Energy Saving

The total energy consumed by HORIBA in 2000 was 1,270 ton-C (as carbon converted value), which is 1% lower than in 1999. The considerable amount of electricity saved more than made up for the increase in city gas consumed. In the second stage of the environmental program, HORIBA is aiming to reduce total energy consumed at the optimal rate for electricity and gas as the most effective way to save total energy. The target for reducing total energy consumed is 1% per year converted to the production of CO₂.

Energy Consumption converted into Carbon Dioxide (unit: tons of carbon)



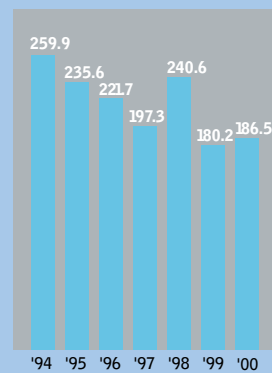
(2) Reducing Waste and Recycling Waste

Target: Recycle 50% of waste by 2001

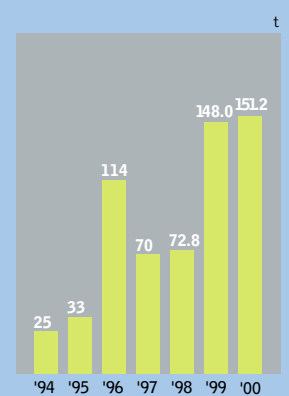
Results: Up to 44.8% of waste was recycled in 2000.

- The total amount of waste is 338t. It is the increase in 2.8% of ratios last year.
- Recycling ratio is 44.8%. With no increase and decrease from last year. The cause that recycling ratio has not been improved is because judgment of wastepaper did not progress.
- Wasteacid of special management decreased from 56t to 27t in six months by introduction of a pure water recovery subsystem.

Waste Dumped Finally Changes

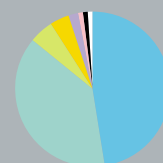


Waste Recycled Changes



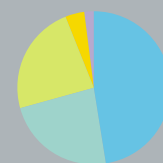
Sorting Box of office papers

Percentage of Waste Dumped Finally in 2000 (Total 187t)



Wasteacid : 47%
Wastepaper : 38%
Wooden pices : 5%
Crashed plastics : 4%
Home Appliance : 2%
Metallic waste : 1%
Glass : 1%
Rubber : 1%

Percentage of Waste Recycled in 2000 (Total 151t)



Crashed plastics : 47%
Metallic waste : 23%
Wastepaper : 23%
Wooden pices : 4%
Waste oil : 2%

(3) Control of Chemicals

The rules for PRTR, which went into effect in 2001 in Japan, obligate an organization that handles a certain amount of pollutant chemicals to maintain records of their release or transfer. HORIBA has already been limiting and restricting the use of such toxic chemicals as chlorine-based organic solvents and greenhouse gases for several years. HORIBA has been maintaining records for those chemicals since 1998 based on the rules for PRTR and has established a control system for those chemicals. The chemicals of which more than 10 kg were used in 2000 were limited to the 11 items listed below. The exhaust of chemicals into the air was reduced by 57% and the waste disposed of was reduced by 46% from the previous year.

PRTR, pollutant release and transfer register

In 1996, referring to the declaration adopted at the United Nations Earth Summit, the OECD recommended that member nations introduce a PRTR system. PRTR rules and regulations now exist in the United States, Canada, the Netherlands, the United Kingdom, and other member nations of the OECD. Starting in 2001, all organizations in Japan that use and/or handle certain amounts or certain concentrations of regulated chemical substances are obligated by law to observe the PRTR rules.

PRTR

(Kg/Year)

PRTR Data (Fiscal year 2000)	CAS #	CHEMICALS	IN	OUT	Release			Changed	Transfer	Recycle
					Exhaust	Drain	Dump			
230	7439-92-1	Solder(lead)	470.8	325.8	0.0	0.0	0.0	0.0	3.2	141.8
63	1330-20-7	Xylene(including mixture)	145.4	4.8	9.6	0.0	0.0	49.5	81.4	0.0
47	60-00-4	Ethylenediaminetetraacetic acid	111.0	111.0	0.0	0.0	0.0	0.0	0.0	0.0
346	12027-67-7	Ammonium paramolybdate	33.0	25.5	0.0	0.0	0.0	0.5	7.0	0.0
253	302-01-27	Hydrazine hydrate	31.8	0.0	0.0	0.0	0.0	0.0	31.8	0.0
283	7664-39-3	Hydrofluoric acid(HF50%)	27.4	0.0	0.0	0.0	0.0	2.3	25.1	0.0
24	—	Alkyl benzene sulfonate	16.2	0.0	0.0	0.0	0.0	0.0	16.2	0.0
25	7440-36-0	Antimony	19.3	14.4	0.0	0.0	0.0	0.0	5.0	0.0
40	100-41-4	Ethyl benzene	16.6	0.9	0.0	0.0	0.0	9.4	6.4	0.0
227	108-88-3	Toluene	11.5	0.0	11.5	0.0	0.0	0.0	0.0	0.0
304	1303-96-4	Sodium tetra-borate (borax)	11.4	11.4	0.0	0.0	0.0	0.0	0.0	0.0
Total			894.6	493.8	21.1	0.0	0.0	61.8	176.0	141.8

Numbers in the column of PRTR above indicate the ID numbers of Japanese law.



(4) Air Pollution and Water Quality Control

In addition to observing all environment-related laws and regulations, HORIBA has set voluntary control standards for the exhaust and effluents discharged from its factory. The drainage from rinsing plants is separately treated for reuse, which also helps to reduce water consumption.

Prevention of Air Pollution

HORIBA has no furnaces that emit huge amounts of smoke, and even stopped using waste incinerators many years ago. The use of boilers for heating was discontinued in 1999. In 2000, we began to reduce the use of acid or organic solvents and other evaporating chemicals in the rinsing plants.



Monitoring at HORIBA factory

Control of Water Quality

Drainage from the factory and laboratories is treated before being discharged. The pH is checked and recorded at each rinsing plant. The water quality is monitored 24 hours a day at the outlet drain for any irregular change in the various parameters. The results of monitoring are reported monthly to the municipal office.

An Air Measurement Item and an Actual Measurement

Items to be monitored	Unit	Kyoto City Regulation	HORIBA Standards	Maximum Value		
				1999	2000	
At Outlet	di-chloromethane	ppm -V	200	180	16.0	— Use off
	Xylene	ppm -V	300	28	xx	< 5
	Ammonia	ppm -V	100	28	xx	7
	Fluorine compounds	mg/m ³ N	5	3.5	0.1	0.7
	Hydrogen chloride	ppm -V	20	6	0.5	1
	Nitrogen oxides (NOx)	ppm -V	100	30	1.0	10
	At the Boundary Line	di-chloromethane	ppm -V	2	—	< 0.5
Xylene		ppm -V	1	—	No data	0.3
Ammonia		ppm -V	1	—	No data	< 0.3
Fluorine compounds		mg/m ³ N	0.05	—	0.02	0.02
Hydrogen chloride		ppm -V	0.2	—	0.02	0.02
Nitrogen oxides (NOx)		ppm -V	1	—	0.5	0.022

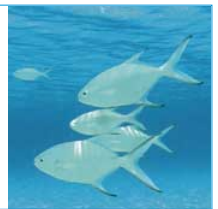
A Drainage Measurement Item and an Actual Measurement

(mg/L)

* is Non Detect. / is omit.

Items to be regulated	Kyoto City Regulation	HORIBA Standards	Maximum Value			xx	
			1998	1999	2000		
Items Concerning to Home Environment	pH	5-9	6-8	6.2-8.0	6.2-8.0	6.2-7.7	/
	n-hexane extract	5	3.5	2.4	2	1.8	/
	phenol	1	0.3	*	*	*	0.002
	copper	3	0.9	0.84	0.21	0.19	/
	zinc	5	1.5	0.219	0.313	0.232	/
	Iron(soluble)	10	3.0	0.439	0.442	0.970	/
	Manganese(soluble)	10	3.0	0.032	0.058	0.030	/
	fluorine	15	4.5	1.11	0.38	0.77	/
	nickel	2	0.6	*	*	*	0.02
	boron	1	0.3	0.212	0.056	0.200	/
Items Concerning to Human Health	Cadmium and its compounds	0.1	0.03	0.001	*	0.001	/
	cyanide	1	0.3	*	*	*	0.1
	Lead and its compounds	0.1	0.07	*	*	0.042	/
	6-chromium	0.5	0.15	*	*	*	0.04
	Arsenic and its compounds	0.1	0.03	*	*	*	0.005
	Mercury and its compounds	0.005	0.0015	*	*	*	0.0005
	trichloro ethylene	0.3	0.09	*	*	0.003	/
	dichloro methane	0.2	0.14	0.007	*	0.016	/
	Carbon tetrachloride	0.02	0.014	0.0006	0.0004	*	0.0002
	1,1,1-trichloroethane	3	0.9	0.0017	0.0027	0.0011	/

Contact with the Community



HORIBA is actively engaged in promoting communication with the community so as to spread and raise awareness about environmental preservation. Our web site includes GAIAPRESS which considers the environment from various angles, SENSORIUM which explains the science of measurement in an easy to understand way, and HONEST where data on acid rain can be shared.

<http://www.horiba.co.jp>



Exhibition Scenery of "Technological Visions of the 21st century"

Typical external activity/example of communication

Some examples of HORIBA's social activities in support of environmental preservation are listed below. They include donations and voluntary services provided by HORIBA, Ltd.

1971 Donated illuminated carbon monoxide indicators to the city of Kyoto. The indicators were installed in the downtown Kyoto.

1992 Presented a number of acid rain measuring kits to elementary schools in the city of Kyoto.

1994 Launched the "HONEST" acid rain information network open to the public.

Participated in a cooperative campaign entitled "Discover Miracles of the Global Environment" held in downtown Kyoto, and demonstrated the technologies of analytical instrumentation to the public.

1995 Participated in the "Miracle Land" exhibition held in Yokohama with informative displays of global environmental preservation programs and the analysis technologies.

Dispatched an engineer to Paraguay as a JICA Expert to assist their water quality monitoring project.

1997 Participated in the "Kyoto Event" held in Tokyo, and exhibited a series of cartoons entitled "EARTH GALLERY" in collaborations with Kyoto Seika University.

Seven (7) HORIBA technical staff were registered by the Environment Agency of Japan as environment counselors to support civil activities.

1998 The JICA expert from HORIBA received the letter of gratitude from the Minister of Japanese Government for his services to Paraguay.

Dispatched HORIBA technical staff to an acid rain center in northwest Japan.

Participated in a study project concerning the acid rain in east Asia.

1999 Japan Environmental Science Association awarded HORIBA staff for effective achievements in environmental chemistry.

2000 HORIBA Digital Driving Recorder HIT-700 was awarded Prize for Superior Performance at the 2nd ECO Drive Contest. (March)

Displayed a series of environmental cartoons at the International Cartoon Show held at UN Headquarters in New York City. (May)

Presented "Some Case Studies of IS-14001 at HORIBA" at a meeting organized by a branch office of Kyoto City. (July)

Demonstrated HORIBA's environment-related technologies and products at "Technological Visions of the 21st Century" held by a leading newspaper corporation in Japan. (August)

The HORIBA Portable Water Quality Multi-Monitor received "R&D 100 Awards" from R&D Magazine in the U.S.A. (September)

The HORIBA Eco-Run Club participated in the "Mileage Marathon" at the Suzuka Race Course. (October)

Received an award from the Council for Promoting Recycling. (October)

Demonstrated the environment-related products at the International Acid Rain Conference. (December)

Environmental Monitors Displayed at Environment Equipment Show Held Concurrently With International Acid Rain Conference.

HORIBA displayed acid rain measuring kits and other environmental monitors at the Environment Equipment Show held concurrently with the First International Acid Rain Conference held in Asia, at the Tsukuba International Conference Hall for six days starting December 11, 2000.

Many government officials, including Director-General Kawaguchi of the Environment Agency (currently the Environment Minister), showed keen interest in HORIBA's analyzers due in part to the fact that the East Asia Acid Rain Monitoring Network was about to begin full-scale operation at that time.

HORIBA's Eco-Run Car Entered in the Suzuka Mileage Marathon

In October of 2000, a car designed by the HORIBA Eco-Run Club ran the entire distance in the Suzuka Mileage Marathon in Japan. Its recorded performance was 285.8 km with one liter (of fuel). A portable automotive emission analyzer was also demonstrated to the audience at the race site.



Officials listened to the HORIBA executive.



HORIBA Eco-Run Club members

Rewarded by the Council for Recycle Promotion

In 2000, HORIBA was awarded the Chairman's Prize of the Council for Promoting Recycle Movement in regards of its effort on the "Elimination of Rinsing from the Process of Circuit Board Making".

Water Quality Monitoring at Lake Ypacaraí

– A JICA Project to support water quality management in Paraguay –

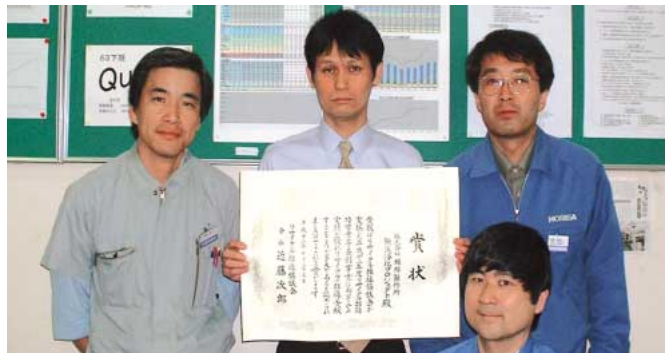
Y. Okubo, JICA Expert

The Republic of Paraguay is a land-locked country slightly larger than Japan located in central southern South America with a population of around 5 million.

Lake Ypacaraí, which is about 30 kilometers east of the capital, Asuncion, is nearly 60 square kilometers in size but has a mean depth of only two meters. It is a national symbol for the people of Paraguay, like Mt. Fuji is for the Japanese, and the lake is a valuable water resource.

Lake Ypacaraí has felt the growing impact of pollution and eutrophication as a byproduct of economic development, and its value as a water resource has been declining. The Japan International Cooperation Agency (JICA) has been extending technical cooperation to improve the situation, and a new cooperative project to define comprehensive water quality policies for the areas around Lake Ypacaraí was started in 1998. I was sent to the Environmental Hygiene Bureau in the Ministry of Health of Paraguay to supervise the task of upgrading the capability of the analysis section, grasping the state of pollution, and proposing key remedial measures, in addition to providing guidance on monitoring.

To conduct effective water quality control of a lake, it is essential to grasp the quality of the incoming water and the sources of pollution. Therefore, we have been monitoring water over a broad area along the nearby rivers. Because the situation does not require continuous measurement by automatic measurement stations, I normally measure



Project members of Elimination of Rinsing

physical parameters using a portable water quality monitor, then analyze the collected samples later in the laboratory.

As the portable analyzer, the HORIBA U-20 multi-component water quality monitor proved extremely popular because it completely satisfied the requirements of being economical, being easy to use, and providing reliable results.

The rivers around the lake are brown and turbid, with waste piled up in some places, due to the discharge of untreated water and the unlawful dumping of waste into the quite shallow rivers. In Paraguay, the voice of the people is not strong enough to pressure the government to take steps to preserve the environment. The government did force some factories to relocate, but then the local residents complained that "the water is cleaner but it cost me a my job." That made me think hard about the whole issue of environment preservation, and how to apply effective remedies in developing nations in particular.

Through our technical cooperation, reports are now being compiled every year, helping to accumulate water quality data. Although data alone cannot solve anything, effective measures cannot be worked out without data. Continued monitoring is required to understand the present situation, formulate and implement policies, and verify the results of the actions taken. Although the actual implementation of an environmental improvement policy must be left to the government, technical and scientific monitoring is an indispensable tool.

When I left Paraguay, I sincerely hoped that the technical cooperation we extended would make some contribution, no matter how small, to the preservation of that country's environment.



HORIBA U-20 Water Quality Monitor at Lake Ypacaraí

HORIBA's Technologies that Support Environmental Programs



HORIBA's advanced technologies for use in analytical instrumentation contribute to the preservation of the global environment. The following table lists examples of how those technologies are applied in the field of environmental programs. Some of the newer products are briefly described for the reader's reference.

Problem	Technology to be applied	Product Model	Legislative requirements
Eutrophication in closed waters	Decomposition by X-ray oxidation	TPNA-200	Stage 5 Regulations to Prevent Gross Water Pollution
Effective use of Electric energy	Narrow band-pass infrared sensor	Motion-sensor light switch	Revised Energy-saving Law
Zero emission vehicle	Determination of gases	MEXA-1260FC	Regulations of CARB and LEV II
Lower emissions from automobile	Determination of low level emissions	MEXA-7000SLE	Regulations of CARB, LEV II, EPA and TIER II
PM and NOx from Diesel vehicles	PM measurement by CO ₂ -conversion	MEXA-1370PM	Regulations of PM from Diesel engines
Air-pollution along an express way	Gas and particulate analysis	AP-360 series	(Coming soon)
Dioxin from incinerators	Optimum combustion control	ENDA-600	Special lows for dioxin
Pollution by VOC from soil	Mass spectrometry	MS-200	Environmental Standards contamination of soil
Sorted collection of waste	Fluorescent X-ray	XGT-2700	PRTR
Depletion of ozone layer	Infrared gas analyzer	VIA-300/500	Montreal Protocol
Long life/Reuse of products	Remote maintenance service	Close customer service	Basic Formation of Recycling Society Law

Energy-saving Motion-sensor Light Switch

This tiny tool applies infrared sensing technology to switch a light on and off automatically by detecting the presence of a person in the room. It can be attached to a socket without the need to modify existing wiring connections. A typical home equipped with these switches might save 220 k-Wh of electricity annually.

Motion-sensor light switch IS-400

照明などの
消し忘れ防止で年間約
5000円の電気代節約!
1kWh:23円 60W照明 10時間点灯で試算

A sticker on each package for the energy-saving campaign (Save ¥5,000/year)



Motion-sensor light switch IS-200

Portable Mass Spectrometer for VOC From Soil

HORIBA's MS-200 battery-powered mass spectrometer detects VOC (volatile organic compounds) evaporation from the soil at the measurement site, and the measured data can be transferred to a computer.



MS-200 detects VOC from soil

Gas Analyzer Supports R&D of Fuel Cells for Automotive Engines

Multiple impurities remaining in a fuel cell gas can simultaneously be detected by the MEXA-1260FC. When used as the source of energy for automotive vehicles, the fuel cell produces far less pollution and generates higher energy efficiency than conventional fuel systems.

Automotive Emission Analyzer System for ULEVs

The levels of pollutants emitted by a ULEV (ultra-low emission vehicle) are required to be close to or even lower than those in the ambient air. HORIBA has developed the MEXA-7000SLE Series Automotive Emission Analyzer System which integrates highly sensitive instruments with a specially designed sample system to comply with ULEV test requirements. The California Air Resources Board (C-ARB) and the U. S. Environmental Protection Agency (EPA) have proposed that in the near future a certain proportion of cars produced should meet ULEV requirements.

Vehicle-mounted NOx Analyzer

HORIBA has developed the MEXA-120 NOx analyzer, which can be mounted on a car to measure the NOx emissions in various driving modes on the road. Because NOx emission levels change greatly depending on the load on the engine, the MEXA-120 is the ideal instrument for measuring real-time NOx emissions.

Trace Gas Analyzers for the Semi-conductor Industry

The gases used in the semiconductor production process are often extremely toxic, so a trace gas monitor is needed to assure the safety of the workplace. HORIBA's GA-360 is a continuous gas measuring instrument which can detect various components of gases at the parts-per-billion level.

HORIBA X-ray Technology in the PRTR Practices

The rules of PRTR (Pollutants Release and Transfer Register) require the operating organization to keep a record of all the materials listed as pollutants when such materials are to be released or transferred. The HORIBA XGT-2700 X-ray Analytical Microscope instantaneously produces graphic data for such toxic metals as mercury, lead, cadmium, and the like in the material, under entirely non-destructive test conditions. The XGT-2700 is an X-ray fluorescence analyzer that utilizes a 10-micrometer X-ray beam.



MEXA-7000SLE for test of Ultra Low Emissions from vehicles

MEXA-1260FC checks impurities in the fuel cell gas



MEXA-120 NOx mounted on a vehicle



FE-215 CO Analyzer



GA-360 detects multi-gases



X-ray Analytical Microscope, XGT-2700

TOPICS

In environmental protection programs, measuring instruments play a key role in researching and/or investigating actual conditions, managing preservation measures, and verifying results, and these instruments must be properly maintained to produce reliable data.

The eutrophication of closed waters that sometimes causes red tides, and particulate matter (PM) in diesel emissions that pollutes urban air have recently been recognized as environmental problems needing urgent attention.

The following topics describe how **HORIBA** has responded to these various issues.

Close Customer Support in the Field

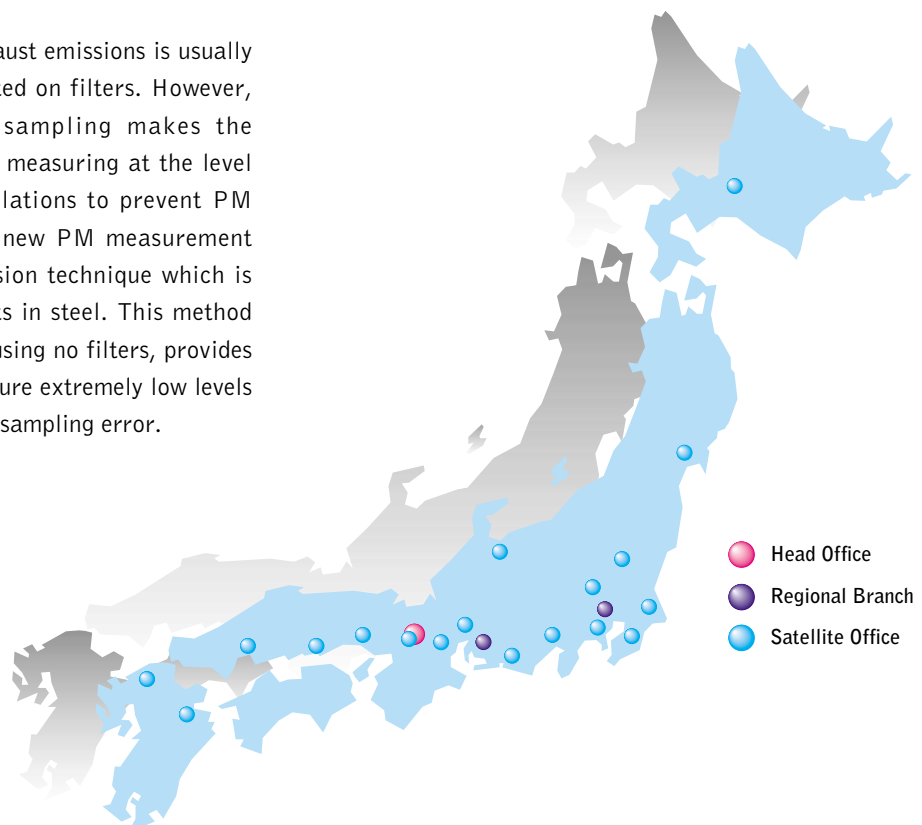
In July of 2000 HORIBA incorporated a new company called HORIBA TECHNO-SERVICE, Ltd. to provide close support in the field to customers using HORIBA products. Taking over all the service activities of HORIBA, Ltd., this new company has 250 service engineers working from 21 service bases throughout Japan. The proper maintenance of instruments is of vital importance to their users and HORIBA TECHNO-SERVICE is dedicated to assisting them.

New System for Measuring Total Nitrogen and Total Phosphorous

In fiscal year 2001 the Japanese government will enforce the Stage 5 Regulations to Prevent Gross Water Pollution to control the total compounds of nitrogen and phosphorous, which are major sources of eutrophication. In response, HORIBA has developed the TPNA-200. The system employs a unique method of decomposition by oxidation utilizing ultraviolet rays to measure total nitrogen and total phosphorous in water. The TPNA-200 consumes less reagent and electricity, and requires less maintenance than conventional systems. This makes it the ideal tool for a wide range of water quality regulations.

New System for Measuring Diesel Particulate Matter Emissions

Particulate matter (PM) in diesel exhaust emissions is usually measured by weighing samples collected on filters. However, the margin of error inherent in sampling makes the conventional method inapplicable for measuring at the level required by recently introduced regulations to prevent PM pollution. HORIBA has developed a new PM measurement method that employs the CO₂ conversion technique which is used for the analysis of trace elements in steel. This method samples the PM in the gaseous phase using no filters, provides excellent reproducibility, and can measure extremely low levels of PM in exhaust samples with far less sampling error.



History of HORIBA's Environmental Activities

The following tables give an outline of HORIBA's activities to protect and preserve the environment, including the development of environmental monitors and our in-company environmental preservation activities. Our record of activities designed to supply environmental analysis technology and information to society reflects our company's stated ideal of "Contributing to the preservation of the global environment and promoting a society in which people live in harmony with nature."

Year	Measures Taken by HORIBA	Year	World Event	
1950s to 1970s	1953	Developed a glass electrode pH meter and entered the analytical instruments business.	1958	Industrial Wastewater Control Law
	1954	Developed a non-dispersive Infrared Gas Analyzer.	1967	Basic Anti-Pollution Law
	1968	Launched a series of measuring instruments for water treatment and water quality monitoring systems.	1968	Clean Air Law
	1970	Started marketing air quality and water quality for the monitoring systems.	1970	Clean Water Law
	1971	Established an environmental control section within the company.	1970	Revised Clean Air Act (U.S.A.)
		Nine (9) HORIBA personnel passed the national examination for pollution control supervisor.	1971	Environment Agency
		Establish a pollution control system within the company.	1971	Qualification of Pollution Control supervisor
		Registered the company's wastewater treatment facilities in line with legislative requirements for water pollution control. (July)	1973	Regulation to Prevent Gross Water Pollution
1979	Became a charter member of the Japan Environmental Technology Association.			
1980s	1982	Established a committee for environmental management within the company. (February)	1987	Montreal Protocol on Substances that Deplete the Ozone Layer
1990s	1990	Reduced the use or switched to substitutes for chlorine-based organic solvents and the specified CFCs. (February)	1991	The Environment Charter: The Federation of Economic Organization
	1992	Participated in the Eco Brazil Exhibition held concurrently with the UNCED.	1992	United Nations Conference on Environment and Development
	1993	Stopped the use of 1,1,1-trichloroethane and switched to dichloromethane. (April)	1993	Basic Environment Law
		Discontinued the use of CFC-113 and switched to the substitute. (April)	1993	Revised Energy Saving Law
		Designed a reusable exhibition booth for events.	1994	United Nations Framework Convention on Climate Change
	1994	Stipulated the company's contribution to environmental preservation in the corporate philosophy.	1995	Packaging Materials Recycling Law
	1995	Started preparation for the introduction of an environmental management system based on BS7750. (September)		
		Started the training of environmental auditors within the company.	1996	Appeal for Environmental Preservation by the Federation of Economic Organization
	1996	Launched the project to qualify for ISO 14001 certification. (January)	1996	Revised Clean Air Law
		Stipulated the company's environmental philosophy and the environmental policy. (November)	1997	Revised Waste Treatment and Cleaning Law
		Started activities to discontinue the use of substitutes for CFCs and dichloromethane. (December)	1997	Kyoto Protocol to the United Nations Framework Convention on Climate Change at COP3
1997	The HORIBA environmental management system was certified as meeting ISO-14001 requirements. (June)	1997		
	Organized an international meeting on the environment in cooperation with the foreign participants of COP3 held in Kyoto.	1998	Revised Energy Saving Law	
	Participated in the ECO JAPAN exhibition held during COP3.	1999	Promotion of Control of Chemicals Law	
1998	Stopped all use of HCFC225. (March)			
1999	HORIBA was designated a 2nd model factory for saving energy. (April)			
	Started a preparatory work on rules for PRTR.			
2000s	2000	Published the first edition of Gaiareport. (January)	2000	Enforcement of Packaging Materials Recycling Law (April)
		Stopped all use of dichloromethane, a chlorine-based organic solvent. (February)	2000	Guidelines on Environmental Account (May)
	2000	HORIBA HIT-700 digital driving recorder won an award in the 2nd Eco-drive Contest. (March)	2000	Basic Formation of Recycling Society Law (June)
		Developed and installed the HORTEM-21 multi-channel automatic monitoring system to control the various items of environmental aspects. (March)	2000	Revised Waste Treatment and Cleaning Law (June)
		Implemented the recycling of packaging materials in line with legislative requirements. (April)	2000	International Acid Rain Conference at Tsukuba (December)
		Published the second edition of Gaiareport. (November)	2001	Enforcement of Pollutant Release and Transfer Law (January)
	2001	Established the Bio Applied System, Ltd. as a subsidiary for studies on endocrine disrupters. (January)	2001	Enforcement of Home Appliances and Food Recycling Law (April)]
		Established the Environmental Project Stage 2. (March)	2001	Enforcement of Green Purchasing Law (April)
	Began project to expand environmental management activities based on ISO-14001 to all the local sales offices. (April)			

An underwater photograph showing several black and white striped fish swimming in clear blue water. The fish are scattered across the frame, with some in the foreground and others further away. The water has a slight ripple, and the overall scene is bright and clear.

HORIBA

Explore the future

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